

NCTU OpenCourseWare

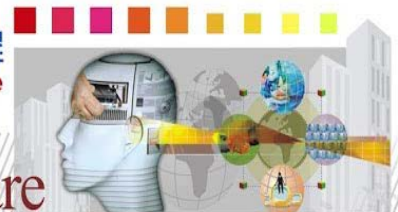
# The Sustainable Model of NCTU OCW

Ta-Wei Li, Yue-Shuang Chang, Feng-Chen Hsieh,  
Ken Nett Khoo & Mong-Ying Lin

**Open education Office  
National Chiao Tung University**

國立交通大學開放式課程  
NCTU OpenCourseWare

We Open We Share



# Introduction – OCW in Taiwan

- OCW was one of the most successful e-learning project launched in Taiwan. When we looked back in 2006, it seemed to be easy to convince administration to launch the OCW project with the “e-learning” or “digital learning” keywords, because that was the rise of digital technology and internet at that time. However, it would be quite difficult to convince administration with the keyword of “openness”, because higher education institutions were traditionally built on the principles of scarcity and closure. Until now, it was still quite difficult to sustain the OCW project at most of university in Taiwan.
- [Ma, Y.-N. \(2010\)](#) and [Hu, S. \(2011\)](#) studied how the participation of the teachers affected the sustainability of OCW.
- [Li, Y.-Z. \(2009\)](#) tried to find the factors why students resisted to use OCW as study materials at NTNU. [Hong, J.-F. \(2010\)](#) compared the usage of OCW between NTNU and OCW. Both of them investigated how the usage of OCW influenced the sustainability of OCW.



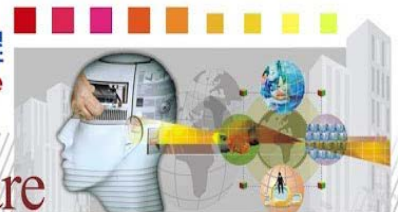
# Introduction – OEO and NCTU OCW

- Our office, the open education office (OEO), is the task force in the academic affairs office at National Chiao Tung University (NCTU). OEO serves the creation and development of OCW, and assists the integration and application of OCW. The most significant factors to maintain the sustainability of OCW include the financial support of the administration, the participation of the teachers and the usage of OCW.
- The details of these factors was reorganized and induced to “**Cornerstone**, **Keystone** and **Capstone**” shown as the following slices.



# Cornerstone, Keystone & Capstone

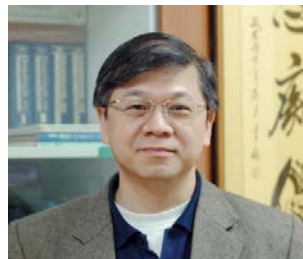
- Cornerstone of NCTU OCW
  - 2 important advocators and financial support from administration
  - 3 good First NCTU OCW
  - Breadth and depth of NCTU OCW
  - Continuous Growth of Click Rate and NCTU OCW
- Keystone of NCTU OCW
  - Make good recording
  - Delicate post-editing
- Capstone of NCTU OCW :
  - National Excellent Teachers
  - Great number of positive feedback from students
  - OE Global Awards – Leadership and Educator



## Cornerstone 1 of NCTU OCW –

### 2 important advocators & finance support from administration

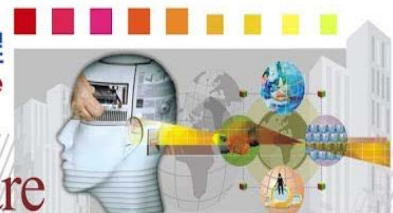
- In Taiwan, National Chiao Tung University (NCTU) was the first university to launch the OCW project in 2006. **Prof. Lee, Wei-I** and **Prof. Pai, Chi-Kaung** are the main promoters. They built up open education office (OEO) at NCTU and Prof. Pei is the first director. In 2008, they pushed NCTU to pass **NCTU OCW rewards policy** which was the most important movement of NCTU OCW and showed the positive promotion of participation for the OCW professors at NCTU.



國立交通大學開放式課程  
NCTU OpenCourseWare

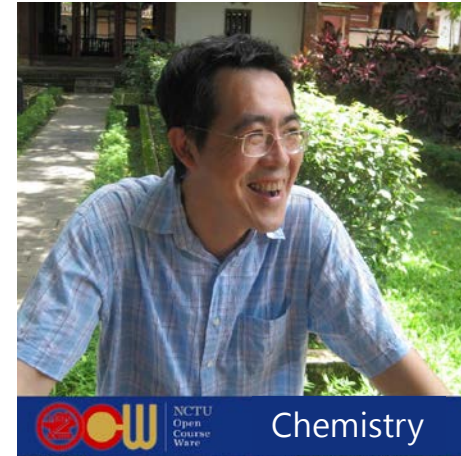
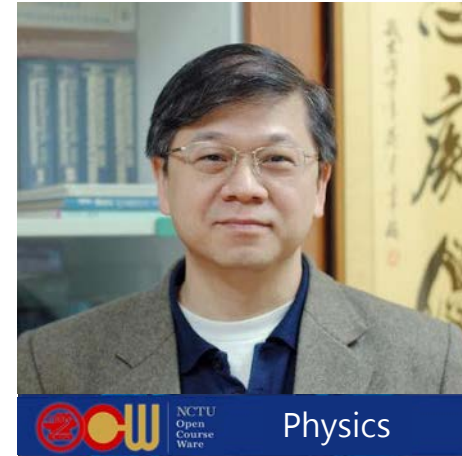
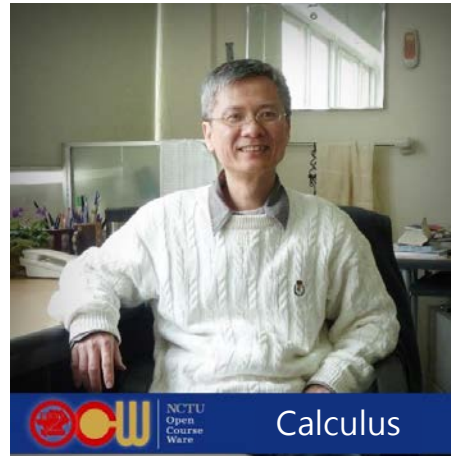
[Back to Cornerstone, Keystone & Capstone](#)

We Open We Share



# Cornerstone 2 of NCTU OCW – 3 Good First NCTU OCW

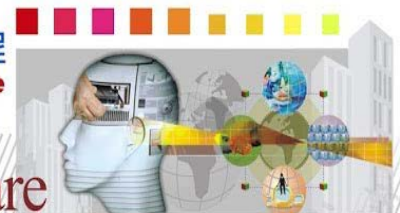
- The first three OCW courses, calculus, physics and chemistry, were published in 2007 and satisfied the most requests of NCTU freshmen since 2007. The calculus OCW of Pro. Juang, Jong are one of the most popular OCW in Taiwan, and its average click rate is 9938 times/month since 2007.



國立交通大學開放式課程  
NCTU OpenCourseWare

Back to Cornerstone, Keystone & Capstone

We Open We Share

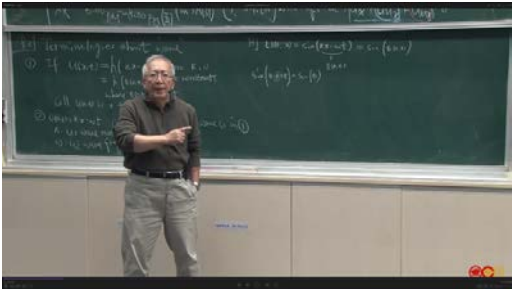


# Cornerstone 3 of NCTU OCW – Breadth and depth of NCTU OCW

Electromagnetics



Introduction to  
Partial Differential Equations



Polymer Physics



**伊斯蘭文明** Introduction to Islamic Civilization  
趙錫麟老師




**巨量資料分析** Analysis Of Big Data  
李育杰老師



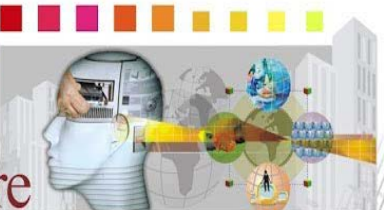

**空間與地景** Space and Landscape  
龔書章老師




國立交通大學開放式課程  
NCTU OpenCourseWare

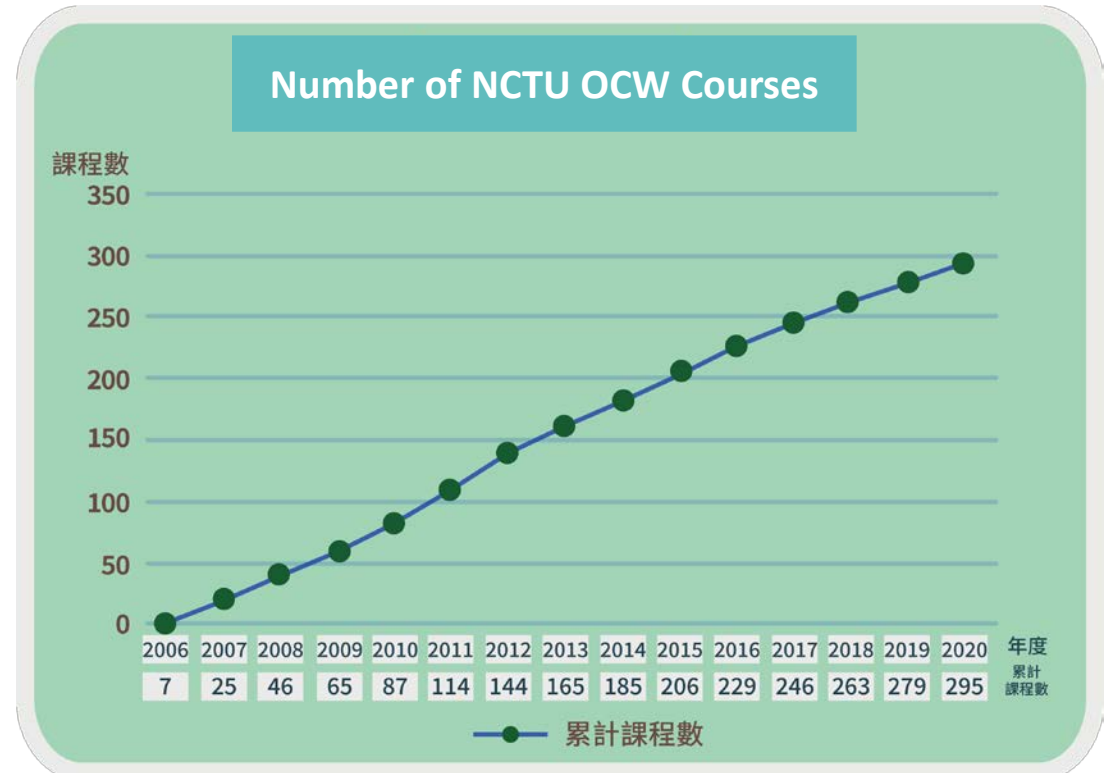
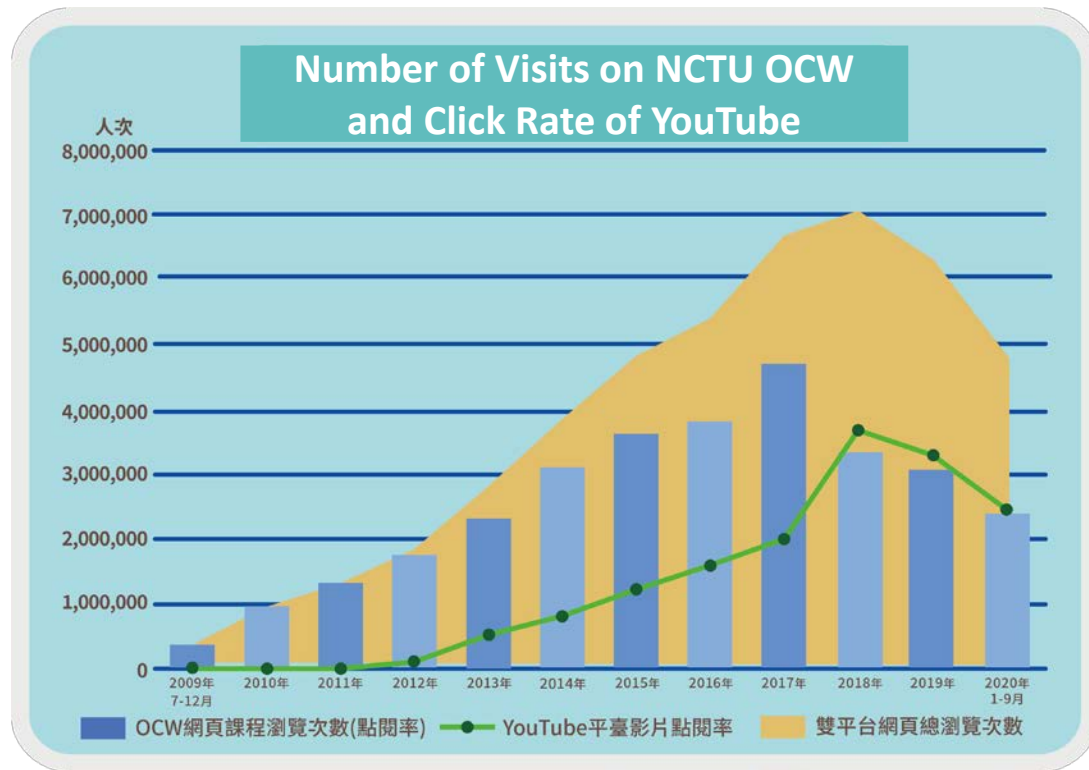
Back to Cornerstone, Keystone & Capstone

We Open We Share



# Cornerstone 4 of NCTU OCW –

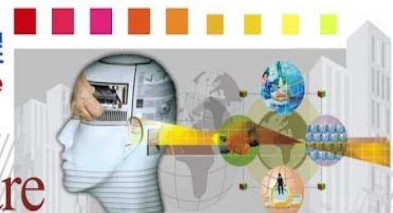
## Continuous Growth of Visits and Courses of NCTU OCW



國立交通大學開放式課程  
NCTU OpenCourseWare

Back to Cornerstone, Keystone & Capstone

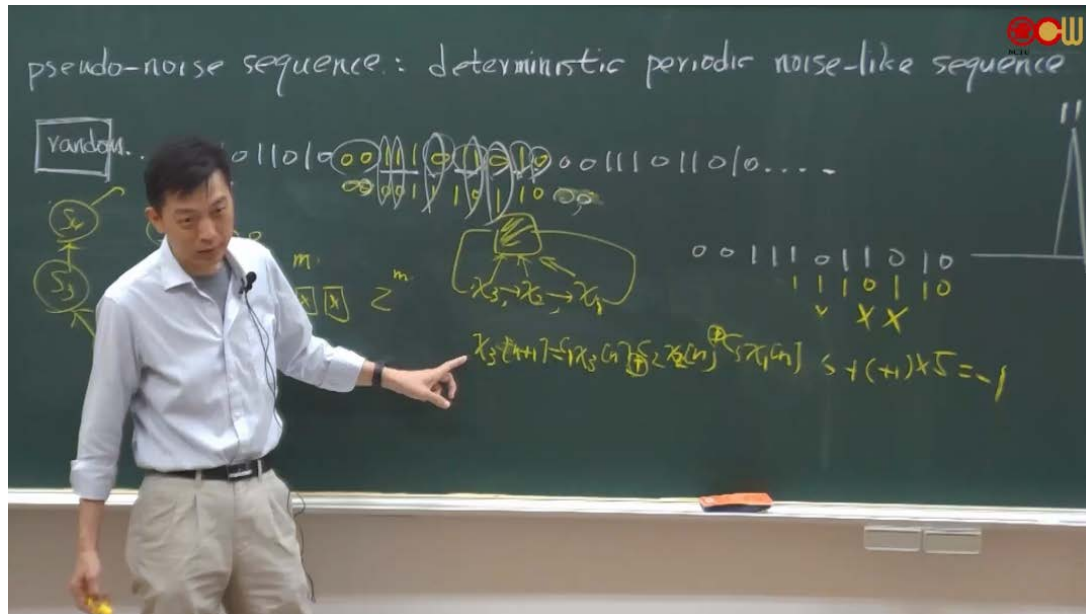
We Open We Share





# Keystone 1 of NCTU OCW – Make good recording

## 1. Discuss with teachers about the recording style



### 7.2 Pseudo-noise sequences

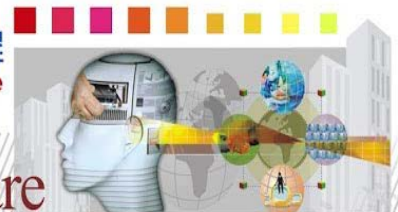
- Power spectrum view

Suppose  $c(t)$  is perfectly white with  $c^2(t) = 1$ . Then,

$$m(t) = b(t)c(t) \text{ and } b(t) = m(t)c(t).$$

Question: What will be the power spectrum of  $m(t)$ ?


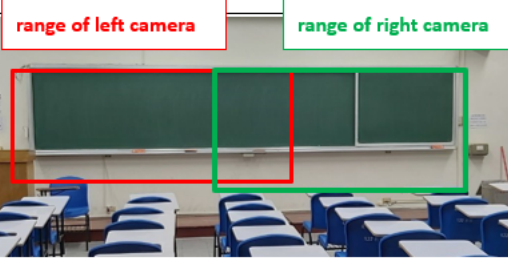
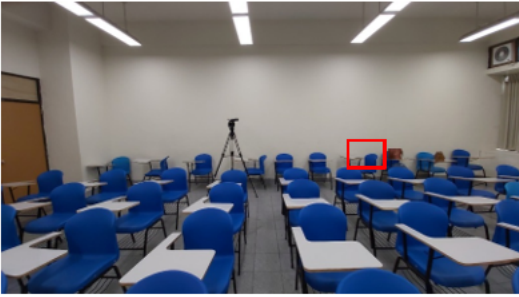
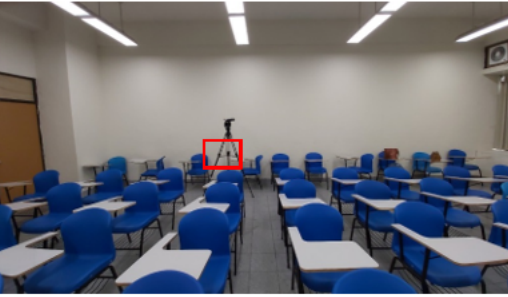
Po-Ning Chen@cm.nctu Chapter 7-9



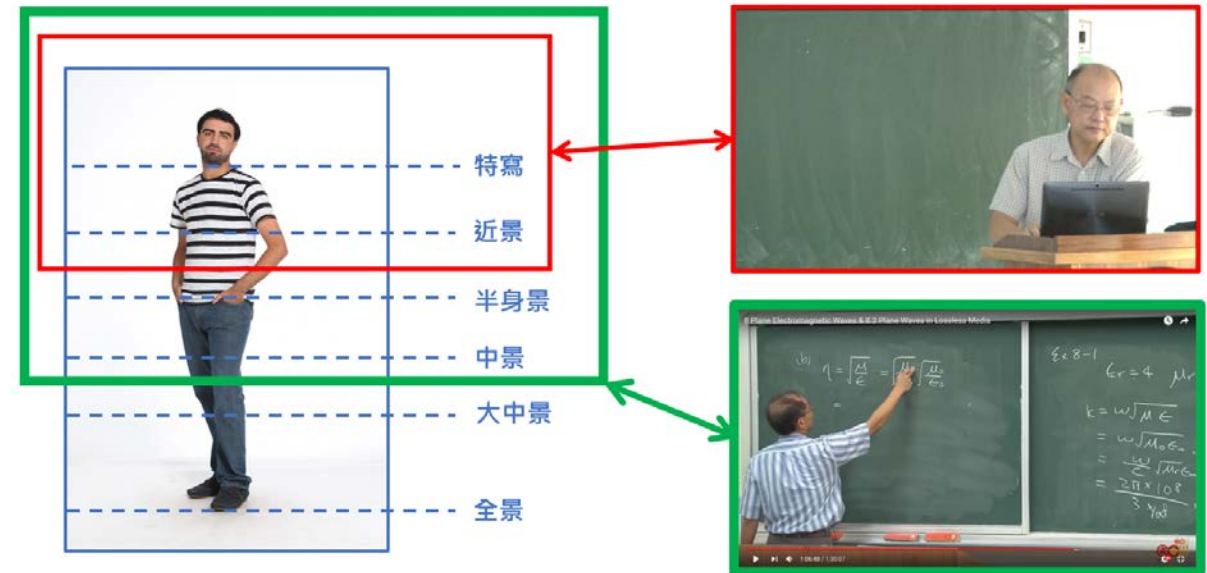
# Keystone 1 of NCTU OCW – Make good recording

## 2. Pre-investigate classrom and make recording rule



EE132 classroom	
	
panoramic view of EE132 classroom	Video recording range
	
position of the left video camera	position of the right video camera

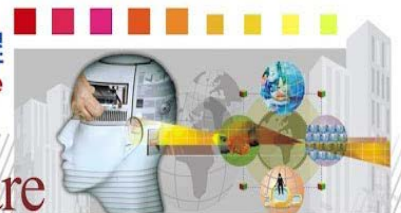
Typical portrait lengths of OCW



國立交通大學開放式課程  
NCTU OpenCourseWare

Back to Cornerstone, Keystone & Capstone

We Open We Share



Keystone 1 of NCTU OCW – Make good recording

3. Avoid common recording problems by student assistants

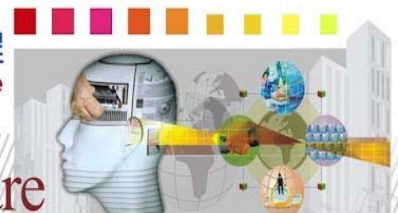
camera shaking

camera focus on the confused contents

wrong ratio of teacher's size

Vocal problem

國立交通大學開放式課程  
NCTU OpenCourseWare



Back to Cornerstone, Keystone & Capstone

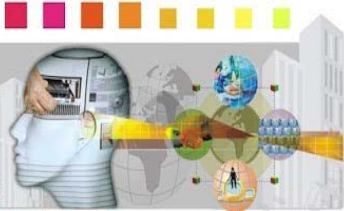
We Open We Share

# Keystone 2 of NCTU OCW – Delicate post-editing

## 1. Post-editing with 2 camera angles (sometimes 3 angles)

The screenshot displays a video editing software interface with the following components and annotations:

- Effects Panel (Left):** Shows various adjustment options. A red box highlights the 'Sharpen' section with 'Sharpen Amount' set to 20, and the 'Brightness & Contrast' section with 'Brightness' and 'Contrast' both set to 5.0. A yellow box below this panel lists:
  1. Sharpness adjustment
  2. Brightness adjustment
  3. Vocal adjustment
- Video Preview (Top):** Shows two camera angles of a lecturer at a chalkboard. A red box encompasses both angles. A yellow box below the preview area contains the text: 'Select appropriate angle to make lecture clear to students'.
- Timeline (Bottom):** Shows multiple tracks for video and audio. A red box highlights a segment on the timeline, with a yellow box containing the text: 'Cut the video irrelevant to the main lectures'.



# Keystone 2 of NCTU OCW – Delicate post-editing

## 2. Make picture-in-picture video and highlight the lecture content

The image shows a video editing interface with several key elements:

- Top Left:** A small video window labeled "原畫面" (Original Video) showing a lecturer at a desk.
- Top Center:** A whiteboard with handwritten text: "Iso stress : stress must be the same of individual A, B". Below it is a diagram of a rectangular block with arrows indicating stress. A red box highlights the text "strain is 'not' the same of individual A, B" with a red double-headed arrow and the label "highlight mark".
- Top Right:** A blue-tinted version of the whiteboard. A red circle highlights the word "the" in "strain is 'not' the same", with a red double-headed arrow and the label "original pointer".
- Bottom Left:** The "Video Effects" panel. The "Motion" section is expanded, showing "Scale" set to 31.0. The "Crop" section is also expanded, showing "Left" at 10.1%, "Top" at 2.8%, "Right" at 10.9%, and "Bottom" at 2.1%.
- Bottom Center:** The main video preview window showing a timeline with multiple tracks (Video 1-7, Audio 1) and a "Title" track. A yellow arrow points from the "Title" track to the whiteboard content.
- Bottom Right:** A detailed view of the "Title" track on the timeline, showing a red box around a "Title" clip.

Adjust the pictures size to make picture-in-picture video

Use "Title" function to add highlight marks to show the target pointed by lecturers

# Keystone 2 of NCTU OCW – Delicate post-editing

## 3. Correct the video errors: either blackboard or vocal

From energy balance equation:  $\Rightarrow \frac{dS_{cv}}{dt} = \sum \dot{m}_i s_i +$

rate of change:  
+In - out + generation

$\frac{dS_{cv}}{dt} = \sum \dot{m}_i s_i - \sum \dot{m}_e s_e + \sum \frac{\dot{Q}_{cv}}{T} + \dot{S}_{gen}$

heat transfer

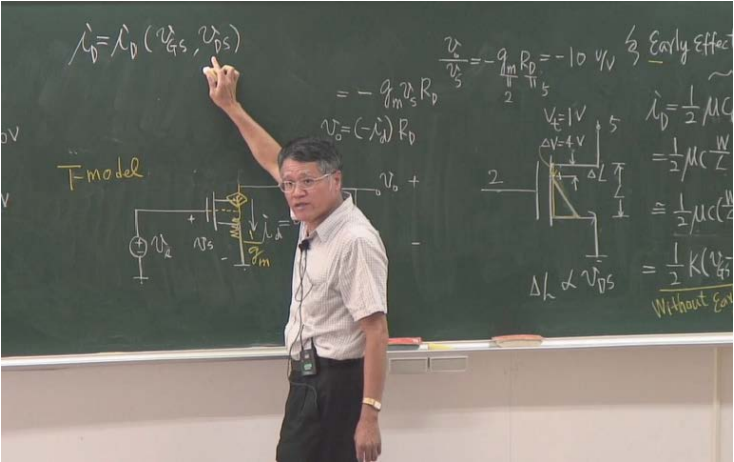
Wrong sign!  
"+" should be corrected into "-"

Trace the recorded video, to find the handwriting of "+" written by this lecture himself. Then, copy and past to correct the video.

Trace the recorded video, to find the sound of "+" . Then, copy and past to correct the sound.

# Capstone 1 of NCTU OCW: National Excellent Teachers

Three professors support NCTU OCW and won “National Excellent Teacher Award” which is the most prestige teacher award in Taiwan. President Tsai presents awards to winners.



Professor Chen, Jenn-Fang  
National Excellent Teacher Award 2016



Professor Wu, Bing-Fei  
National Excellent Teacher Award 2017



Professor Juang, Jong  
National Excellent Teacher Award 2019

# Capstone 2 of NCTU OCW:

## Great number of positive feedback from students

**An Indian Professor previewed the OCW of Pro. Chen in order to help the preparation of his class.**

I am Prof. [redacted] College of Engineering, Bangalore, India. This semester I am teaching Microelectronic Circuits for 6th semester students of our institute. I have seen your video lectures from YouTube on microelectronics. However, I am unable understand language. But I have taken notes from the lectures. I hereby request you to develop these lectures in English so that we can adapt your teaching ideas in our career...

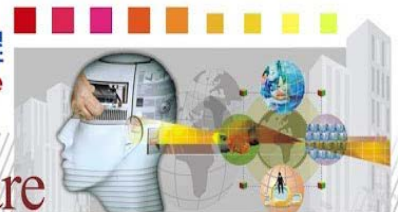
**A NCTU alumini reviewed the OCW of Pro. Wu in order to help solve problems met in his job.**

電工98級校友：現在才來後悔為什麼當初沒有一心向學根本浪費時間，我回到原點，上母校的開放式課程，發現了吳炳飛老師的線性控制系統，透過老師的課程，我擁有了嶄新的視野，讓我可以不同角度分析電路，比起舊方法，我改用Simulink這個程式重新設計。結果我一週可以模擬一千多次，最後還成為公司有史以來PLL誤差最小的一次。真的很感謝老師在開放式課程上給予我們這群已經脫離學生的人一次機會，讓我在工作上得到了很大的成就感...

**A grandma studied the calculus OCW of Professor Juang in order to tutor her grandson at home.**

而我，只是個英文老師，除了默默觀望著他們，難道能插入他們之間的對話嗎？而且隔行如隔山，我又能說些什麼呢？此時正巧，但也算是因緣際會吧！從兒子那兒得知了交通大學的開放式課程，紮實的從基礎教起，給了我一次機會。說實在的，在我們那時代能做老師的還能稱得上是知識份子，雖然那些數學符號在我年湮代遠的記憶裡是如此模糊，但按部就班的學習加上一周五天給我練習，還是依稀能夠回憶起高中數學老師上課的內容。於是我轉變成他與孫子之間的橋樑，而孫子也會從網路找些稀奇古怪的問題來問我，即便我也不是全部都能理解，但能增加我們之間的互動，就已經很開心能挽回這段難得的祖孫情誼，也多虧了開放式課程，不吝於提供影片與講義給我這樣的可能性。

國立交通大學開放式課程  
NCTU OpenCourseWare



Back to Cornerstone, Keystone & Capstone

We Open We Share



# Capstone 3 of NCTU OCW:

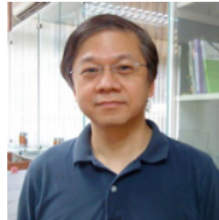
## OE Global Awards

Professor Pai, Chi-Kaung  
ACE Leadership Award 2013



Professor Lee, Wei-I  
OE Global Leadership Award 2016

### LEADERSHIP AWARD



**Prof. Wei-I Lee**, second recipient of a Leadership Award, is a major advocator of the open education movement in Taiwan and is one the founders of Taiwan Open Course Consortium (TOCC). Many Taiwanese universities joined TOCC because of his enthusiasm and passion for open education. In 2012, he piloted the "ewant" program and started the first MOOC platforms in Taiwan that collects courses from more than 55 universities in Taiwan and China. Since then, "ewant" open education platform ([www.ewant.org](http://www.ewant.org)) has been one of the most successful MOOC platforms in the Chinese-speaking region.

Professor Tong, Lee-Ing  
OE Global Educator Award 2018

### EDUCATOR AWARD

**LEE-ING TONG**, Distinguished Professor, National Chiao Tung University

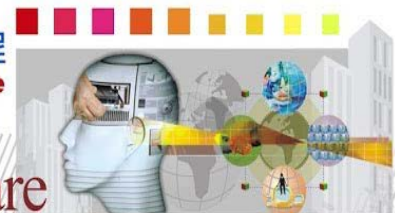


Besides doing extensive research, Professor Lee-Ing Tong exhausts all her energies teaching statistics-related courses. She hopes students are not only learning in the classroom, but also through exploring knowledge further by themselves. Professor Tong has won the excellent teaching award 3 times; one was from University of Massachusetts-Dartmouth and two were from National Chiao Tung University.

Back to Cornerstone, Keystone & Capstone

We Open We Share

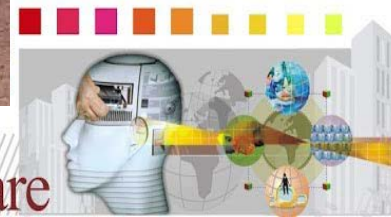
國立交通大學開放式課程  
NCTU OpenCourseWare



# OEO Colleagues



We Open We Share

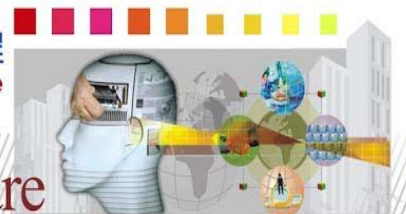


# National Chiao Tung University



國立交通大學開放式課程  
NCTU OpenCourseWare

We Open We Share



# References

- Li, Y.-Z. (2009). *A Study on the Influence of the User Resistance in OpenCourseWare* (Master's thesis, National Taiwan Normal University). Retrieved from <https://hdl.handle.net/11296/4qcg48>
- Ma, Y.-N. (2010). *A Study of the University Faculties' participation in OpenCourseWare Based on the Concerns-Based Adoption Model* (Master's thesis, National Taiwan Normal University). Retrieved from <https://hdl.handle.net/11296/xqte92>
- Hong, J.-F. (2010). *A Study on the Usage Evaluation of the OpenCourseWare in National Taiwan Normal University and National Chiao Tung University* (Master's thesis, National Taiwan Normal University). Retrieved from <https://hdl.handle.net/11296/szwq66>
- Hu, S. (2011). *Factors Influencing Teachers Participated in OpenCourseWare : A Case Study of National Taiwan Normal University* (Master's thesis, National Taipei University of Education). Retrieved from <https://hdl.handle.net/11296/6btvxc>

